CLAIMS

What is claimed is:

1.   A method of accessing and maintaining socket control information for high speed network connections, the method comprising the steps of:

        storing socket control information in a control block (CB) cache in a transport offload engine (TOE);

        wherein CB entries in the CB cache are comprised of socket control information for sockets assigned to the TOE by a host computer;

        wherein the CB cache is a multi-port device providing direct access to the CB cache via each port;

        wherein a first port is dedicated to transmit logic within the TOE; and

        wherein a second port is dedicated to receive logic within the TOE.

2.   A method as recited in Claim 1, further comprising the step of:

        dedicating a port to an optional memory;

        wherein the optional memory stores CB entries that are directly accessible by the CB cache via the port; and

        wherein the optional memory also serves as main memory for the TOE.

3.   A method as recited in Claim 2, wherein one entry in the CB cache is kept empty to facilitate reading a CB entry from the optional memory before writing a CB entry into the optional memory.

4.   A method as recited in Claim 1, further comprising the step of:

        dedicating a port for host transfers of CB entries.

5.   A method as recited in Claim 1, wherein CB entries are read from the CB cache in a word order that is dependent upon a port's purpose.

1   6. A method as recited in Claim 1, further comprising the step of:

2   dedicating a port to low demand TOE clients; and

3   wherein the low demand TOE clients are granted access to the port based on a

4   priority.

1   7. A method as recited in Claim 1, further comprising the step of:

2   providing field locking means for locking a specific field within a CB entry that is

3   being accessed by a port;

4   wherein the locking means prevents other ports from accessing a locked field.

1   8. A method as recited in Claim 1, further comprising the steps of:

2   providing a hash reference table;

3   wherein the hash reference table is comprised of hash values corresponding to each

4   CB entry in the CB cache;

5   creating a hash value for a received network packet;

6   comparing the received network packet hash value with hash values in the hash

7   reference table; and

8   searching for a corresponding CB entry in the CB cache via a port if the network

9   packet hash value matches a hash value in the hash reference table.

1   9. A method as recited in Claim 1, further comprising the steps of:

2   providing a CB identifier reference table;

3   wherein the CB identifier reference table is comprised of a unique CB identifier

4   corresponding to each CB entry in the CB cache and an associated CB cache

5   index;

6   creating a CB identifier by parsing out a CB identifier from a CB access address;

7   comparing the CB identifier with CB identifier values in the CB identifier reference

8   table;

9   accessing the CB cache via a port using the CB cache index of a matching CB

10   identifier value in the CB identifier reference table; and

11	wherein if the CB identifier does not match a CB identifier value in the CB identifier
12	reference table, then the corresponding socket has either not been assigned to
13	the TOE or the CB entry must be brought into the cache from an optional
14	memory.

1	10.	A method as recited in Claim 2, further comprising the steps of:
2		providing a CB identifier reference table;
3		wherein the CB identifier reference table is comprised of a unique CB identifier
4		corresponding to a CB entry for each socket assigned to the TOE and an
5		associated CB cache index;
6		creating a CB identifier for a CB access by parsing out a CB identifier from a CB
7		access address;
8		comparing the CB identifier with CB identifier values in the CB identifier reference
9		table;
10		accessing the CB cache via a port using the CB cache index of a matching CB
11		identifier value in the CB identifier reference table;
12		wherein if the CB identifier does not match a CB identifier value in the CB identifier
13		reference table, then the CB is not in the CB cache; and
14		providing means for retrieving a corresponding CB entry from the optional memory
15		and placing the retrieved CB entry in the CB cache, if the CB cache index of
16		the matching CB identifier value indicates that the CB entry is not in the CB
17		cache.

1	11.	An apparatus for accessing and maintaining socket control information for high speed
2		network connections, comprising:
3		a mechanism for storing socket control information in a control block (CB) cache in a
4		transport offload engine (TOE);
5		wherein CB entries in the CB cache are comprised of socket control information for
6		sockets assigned to the TOE by a host computer;
7		wherein the CB cache is a multi-port device providing direct access to the CB cache
8		via each port;

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9   wherein a first port is dedicated to transmit logic within the TOE; and

10   wherein a second port is dedicated to receive logic within the TOE.

1   12.   An apparatus as recited in Claim 11, further comprising:

2   a mechanism for dedicating a port to an optional memory;

3   wherein the optional memory stores CB entries that are directly accessible by the CB

4   cache via the port; and

5   wherein the optional memory also serves as main memory for the TOE.

1   13.   An apparatus as recited in Claim 12, wherein one entry in the CB cache is kept empty

2 to facilitate reading a CB entry from the optional memory before writing a CB entry into the

3 optional memory.

1   14.   An apparatus as recited in Claim 11, further comprising:

2   a mechanism for dedicating a port for host transfers of CB entries.

1   15.   An apparatus as recited in Claim 11, wherein CB entries are read from the CB cache

2 in a word order that is dependent upon a port's purpose.

1   16.   An apparatus as recited in Claim 11, further comprising:

2   a mechanism for dedicating a port to low demand TOE clients; and

3   wherein the low demand TOE clients are granted access to the port based on a

4   priority.

1   17.   An apparatus as recited in Claim 11, further comprising:

2   field locking means for locking a specific field within a CB entry that is being

3   accessed by a port;

4   wherein the locking means prevents other ports from accessing a locked field.

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1   18.   An apparatus as recited in Claim 11, further comprising:

2   a hash reference table;

3   wherein the hash reference table is comprised of hash values corresponding to each

4   CB entry in the CB cache;

5   a mechanism for creating a hash value for a received network packet;

6   a mechanism for comparing the received network packet hash value with hash values

7   in the hash reference table; and

8   a mechanism for searching for a corresponding CB entry in the CB cache via a port if

9   the network packet hash value matches a hash value in the hash reference

10   table.

1   19.   An apparatus as recited in Claim 11, further comprising:

2   a CB identifier reference table;

3   wherein the CB identifier reference table is comprised of a unique CB identifier

4   corresponding to each CB entry in the CB cache and an associated CB cache

5   index;

6   a mechanism for creating a CB identifier by parsing out a CB identifier from a CB

7   access address;

8   a mechanism for comparing the CB identifier with CB identifier values in the CB

9   identifier reference table;

10   a mechanism for accessing the CB cache via a port using the CB cache index of a

11   matching CB identifier value in the CB identifier reference table; and

12   wherein if the CB identifier does not match a CB identifier value in the CB identifier

13   reference table, then the corresponding socket has either not been assigned to

14   the TOE or the CB entry must be brought into the cache from an optional

15   memory.

1   20.   An apparatus as recited in Claim 12, further comprising:

2   a CB identifier reference table;

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3   wherein the CB identifier reference table is comprised of a unique CB identifier

4   corresponding to a CB entry for each socket assigned to the TOE and an

5   associated CB cache index;

6   a mechanism for creating a CB identifier for a CB access by parsing out a CB

7   identifier from a CB access address;

8   a mechanism for comparing the CB identifier with CB identifier values in the CB

9   identifier reference table;

10   a mechanism for accessing the CB cache via a port using the CB cache index of a

11   matching CB identifier value in the CB identifier reference table;

12   wherein if the CB identifier does not match a CB identifier value in the CB identifier

13   reference table, then the CB is not in the CB cache; and

14   means for retrieving a corresponding CB entry from the optional memory and placing

15   the retrieved CB entry in the CB cache, if the CB cache index of the matching

16   CB identifier value indicates that the CB entry is not in the CB cache.

1 21.   An apparatus for accessing and maintaining socket control information for high speed

2 network connections, comprising:

3   a multi-port SRAM control block (CB) cache in a transport offload engine (TOE);

4   wherein CB entries in the CB cache are comprised of socket configuration

5   information for sockets assigned to the TOE by a host computer;

6   wherein the CB cache provides TOE clients direct access to the CB cache via each

7   port;

8   a mechanism for dedicating a ports to time critical TOE clients;

1 22.   An apparatus as recited in Claim 21, further comprising:

2   a mechanism for arbitrating access between TOE clients sharing a common port in

3   the multi-port device based on a priority; and

4   wherein time critical TOE clients are assigned a higher priority.

1 23.   An apparatus as recited in Claim 21, further comprising:

2   a mechanism for dedicating a port to low demand TOE clients; and

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3   wherein the low demand TOE clients are granted access to the port based on a

4   priority.